UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 Ross Avenue
Dallas, Texas 75202-2733

April 10, 2012

Via e-mail – mreagan@mcginnislaw.com & jdhead@fbhh.com

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Dear Mary & J.D.

Sorry for the delay, but I have enclosed our informal comments on the proposed permitting action relating to the oil reclamation unit. If you have any questions, please feel free to e-mail me or call me at (214) 665-8074.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosures

Evaluation of US Ecology Robstown Air Emissions and Sources

General

US Ecology of Robstown Texas (USET) owns a waste Treatment Storage and Disposal site near Robstown, TX on which several distinct operations are ongoing. These operations include the operation of a landfill that disposes of industrial wastes, a waste oil recovery operation, solid and sludge/liquid waste stabilization and landfill operation, contaminated catalyst reclamation operation, and a thermal desorption operation used to strip media such as soil and catalyst of VOCs, halogenated compounds, and some metals such as mercury.

Questions have arisen regarding the air contaminant emissions from this USET site. This paper addresses some aspect of the operations of the facility regarding their air emissions and emissions controls that would be recommended for such a site.

Reference discussions the review is based on the following documents:

1. US Patent Document Number 4,864,942 which is similar to unit proposed
2. Southern Maryland Wood Treating Site – Proof of Performance Re-test report (Provided by USET)
3. Santa Barbara County Draft Operating Permit 13511
4. X*TRAX Mobile System Final Report by Chemical Waste Management, Inc. (provided by USET)
5. Air Emissions Spreadsheet provided by US Ecology characterizing the sources at the site and estimating the emissions from those sources. (Provided by USET)
6. Technical Requirements for On-Site Thermal Desorption of Solid Media Contaminated with Hazardous Chlorinated Organics, Final Report. By The Interstate Technology and Regulatory Cooperation Work Group, Low Temperature Thermal Desorption Work Team.
7. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances (EPA-600/R-97-116), Eklund, et. al., 1997.
8. Guidance on Limiting Potential to Emit in New Source Permitting memo dated June 13, 1989 from John Seitz
9. Authorizations for Air Emissions from the TCEQ for the site.

Organization

This document addresses two topics: 1) comments on proposed emissions estimation techniques used by USET in their provided spreadsheet; and 2) comments on control/monitoring of the processes that should be included in any authorization governing the operations at the site as a whole.

Comments on emissions estimation spreadsheet provided by USET

1. Maximum ppmw seems to be at odds with the maximum PPM values on the "Materials Property" list. Clarify.
2. Generally, give specific origin of source of factors and values provided.

3. Maximum average values for annual info must be reflective of actual 12-month rolling average, calculated preferably daily using the daily production data, since this is how the site operates, but no less frequently than monthly.

TDU Particulate

1. Pressure drop for any baghouse needs to be measured and recorded daily during operation, and visible emissions observations must be conducted routinely (monthly) for 'no visible emissions' should ever be seen.
2. Must supply origin of factors used (TDS for cooling tower, etc).
3. Baghouse efficiency is listed as outlet grain loading, but there is no demonstration that the capture efficiency is 100% for the sources controlled by the baghouse.
4. Do not understand at all how PM is a volatile contaminant in this case. Please explain. There may very well be VOC emissions from the particulate captured, but there can be no control efficiency claimed by these dust collectors for this type of emissions, since they are volatile. The emissions must be calculated separately using the appropriate vapor pressure data.
5. Emissions factors for rock crushing may not be the best factors to use, might be better characterized by the Cheer Workshop manual by the TCEQ in 1996 dealing with material handling and transfer operations.
6. Estimates of cooling tower emissions should be based on TDS measurements using "Standard Methods for the Examination of Water and Wastewater" Method 2540, method performed at least every other week.

Waste Pile Sources

1. Origin of factors must be provided. No justification given for 'average molecular weight' of materials.
2. Annual concentration must be based on past actual operating records and must be supported by testing of material and daily recordkeeping.
3. Uncertain how acetylene could represent worst case volatile with such a low molecular weight and be representative of actual emissions. Please explain.
4. It appears that the emissions from the transfer of the waste to the processing boxes is not included.

TDU Process Emissions

TDU Non-Stack emissions

1. Does not appear that emissions due to transfer of materials into and out of the TDU heater are accounted for.
2. Startup and Shutdown emissions are not accounted for, nor are the emissions when media is not sufficiently treated (from the heater output bins) and must be rerun. Please account for both.

TCU process vent

1. What happens to the vent stream that is normally fed back into the TDU firebox for final destruction when the system must be shut down? The vent stream cannot be vented directly to

atmosphere uncontrolled, and such a vent stream would probably be present for the length of time it takes for the unit to cool down after such an event anytime that incompletely treated media remains in the heater while the unit cools down. This question is true not only for emergency shutdowns, but for routine shutdowns as well.
2. No stack vent parameters are provided. Does EP-1 vent at an elevation above or below the nearby buildings?
3. No accounting of emissions from the combustion of the off-gas appears to be included. Nor is it clear how combustion controls are to be maintained since the volume and makeup of off-gas would appear to be able to change pretty rapidly. How will oxygen ingress into the 'closed vent system' of the TDU be monitored?
4. Neither $PM_{2.5}$ nor GHG, including methane, emissions appear to be included, and should be.

Stab 2 and 3 VOC/HAP/ammonia

1. Could not find any reference to wind speed in determining VOC emissions from pans. How is this accounted for?
2. No emissions point parameters are provided.
3. Are the equations for VOC emissions from piles also used for the transfer operations where the material is moved from the various points?
4. From the TCEQ authorizations available, it appears that STAB 2 and 3 can and do operate concurrently. Are both facilities still operational? Are the emissions from all three calculated in a similar manner? If not, why not? Estimating methods used in the various authorizations would seem to indicate that the emissions from the two Stabilization buildings vary widely among the three. Please explain/clarify.

Stab 2 and 3 PM and Reagents

1. Uncertain of the origin of the control efficiencies claimed, and how they apply to this operation.
2. Dust collector capture efficiency appears to be assumed as 100% but no evidence/justification of that provided.
3. Permit provisions should require visible emissions observations and dust collector pressure drop readings daily.
4. What is the rationale for the various percentages of the makeup of the materials? Provide the basis for these values.

Catalyst Drum Loading

1. Justify the capture efficiencies assumed.
2. Consider using factors from 1996 Cheer manual for materials transfer operations since it is probably more reflective of the transfer of the materials in question for the conveyed materials.
3. No emissions point characteristics provided.
4. No speciated emissions provided and probably should be since catalysts are included and will ordinarily include metals.

Tanks

1. Why are conservation vents missing in some of the tanks details?
2. Justification for temperatures and vapor pressures must be provided, as most of the liquids are represented at No 6 Fuel Oil and require heated tanks, but the emissions appear to be based on ambient temperature and an undisclosed material for the average molecular weight.
3. Short term (lb/hr) emissions should be based on the following:

Short term emissions calculations (based on output from AP-42 Tanks 4.09d or equivalent):

$$L_{MAX} = (L_W \times FR_M) / (N_x \times T_{CG})$$

L_{MAX} = maximum short term emission rate, lbs/hour
L_W = working loss calculated using AP-42, Chapter 12 at maximum liquid surface temperature, lbs/yr (NOTE: units are lbs/year not lbs/hour. L_W must be calculated using a turnover factor, K_N, of 1.)
FR_M = maximum filling rate, gallons/hour
N = number of turnovers per year, dimensionless
T_{CG} = tank capacity, gallons

4. Looks like the equations for the surge tanks and below may not have included correct lb/hr or tpy emissions.

Comments on control/monitoring of the processes that should be included in any authorization governing the operations at the site as a whole.

The following comments express areas of concern regarding ongoing operations at the site, and should translate into specific requirements in operating authorizations for the source.

Generally on TDU

While the TDU method of treating contaminated media appears to be well established, this company had problems properly operating their TDU in their Nevada facility, and in fact shut down that operation and moved those operations, at least in part, to Texas after a 2008 EPA inspection and subsequent adoption of a consent decree. Included in that resolution of alleged violations, at least in part, were elements of 40 C.F.R. Part 264 related to the operation of the TDU treatment facility. While the Nevada TDU was configured differently the Texas facility, the basic operating conditions will be similar: the unit must operate as designed in order to achieve the removal of contaminants and to properly control those contaminants and not just transfer the contaminants from one media to another. A real possibility in this facility is the creation of Dioxin/Furans (D/F) in the treatment of the contaminated matrix received at this facility.

The TDU represented to us appears to be operated at normal temperatures in excess of any TDU operations for which supporting information was provided. It appears to be very likely that the

formation of D/F is quite possible in normal operations based on the characterization of the materials that could be received for processing, as listed on the company webpage.
In order to verify that the TDU can achieve the claimed efficiencies for air contaminant emissions, then it becomes necessary to test the system under 'worst case' conditions, e.g., maximum loading for material and including chlorine containing materials.

During the initial performance testing, the system integrity must be verified, and if the system operates under positive pressure, then multiple fugitive points of uncontrolled emissions will be present. If the system is operated under negative pressure, then air in-leakage can significantly contribute to formation of dioxins and furans in the process as it normally operates, and so heater vapor space oxygen content range should be established, as should combustion efficiency indicators for the firebox. Also, since it is possible for dioxins and furans to be created in this type of system, the temperature and residence time of the process off-gas in the firebox of the actual unit to be operated must be demonstrated sufficient by testing under worst case normal operating conditions to assure destruction of the off-gas components, including any D/F that may be present. This demonstration must be done in an initial performance test and repeated at least once every 5 years or more frequently if operating parameters repeatedly are out of range established during testing, such as chronic high oxygen in the off-gas. Since it is possible for such a system to have methane emissions, then methane emissions should also be measured during the stack testing.

Since D/F can be created in the system, then the condensed products will also need to be tested for D/F during the initial performance testing.

Operating parameters such as feed rate, heater zone and gas treating system negative pressure, firebox temperature, heater output product temperature, recirculating inert gas recirculation rate, oxygen content of the recirculated off-gas in the heater, and fuel feed rate must be determined by initial testing, and operating alarm or shutdown trip points established.

Because this system undergoes startup and shutdown on a daily or more frequent basis, then the permit must include normal startup and shutdown emissions limitations and emissions verification tracking. In addition there should be an emergency startup/shutdown plan so that emissions from partially treated material do not vent uncontrolled directly to atmosphere.

Daily leak checks (visual) and visible emissions observations should be required for the TDU and various processes, and any sign of visible emissions at all should result in a secession of operations and stop the feed into the heater until the origin of the visible emissions is established.

The vent stream that is normally routed to the firebox must be routed to some type of control when the firebox is not available, such as a carbon canister for control, however, a carbon adsorption system will not control any methane emissions that may be present.

Specific for Permit Contents

Generally

• Tracking and demonstrating emissions: For each facility authorized at the site whose short term or annual emissions are estimated based (in part) on the total throughput for the facility, then the records of each shipment received and each process stream processed (e.g., rate of stabilization processing or tons per hour of media treated in the heater) must be kept (including the units (either shipment or treatment batch) characteristics) and totals determined monthly for each rolling compliance period.

• Maximum VOC limits of 250,000 ppm. How will this be verified on each batch or shipment received? How will this be determined, tracked, and recorded? A method should be specified in the permit.

• Average annual VOC concentration in liquid of 40,000 ppm on a twelve month rolling average. How will this be determined, tracked, and recorded? A method should be specified in the permit.

• Average annual VOC concentration in the solids of 5,000 ppm on a twelve month rolling average basis. How will this be determined, tracked, and recorded? A method should be specified in the permit.

• Limit annual throughput to the TDU to no more than 45,000 TPY on a twelve month rolling total basis. How will this be determined, tracked, and recorded? A method should be specified in the permit.

• Demonstrate how compliance with short term HAP emissions rates will be determined for each source of HAPs authorized by any authorization at the site. How will this be determined, tracked, and recorded? A method should be specified in the permit.

• It does not appear that USET has provided an accounting of the landfill operations related emissions for this source. USET must account for emissions, including fugitive HAP emissions from the landfill. Currently, there are no estimates for landfill emissions either as fugitive or from a gas collection system. Fugitive HAPs emissions must be included in determining if it is a major source for HAPs.

• How will USET determine, quantify, and track speciated emissions (HAPs, specific contaminants represented, VOCs, etc)?

• Model emissions to verify compliance. Emissions have not been modeled comprehensively, and there is reason to believe that some of the ESL and NAAQS might be exceeded by the concurrent operations of the various facilities at the site.

• Some Leak Detection and repair program should be implemented at the site. At least AOV.

TDU Related

• Performance testing on the operational unit must be done to verify the performance efficiency of the condensers. The permit must also include the incorporate operating parameters from performance testing into the permit with appropriate monitoring and record keeping. Automatic temperature control of the kiln and the continuous recording of its temperature are two parameters and operations that should be considered. Another is Monitoring of the oxygen content inside the heater and an alarm system when a specified level is exceeded is desirable to maintain it inert during operations.

• Performance testing must be done to verify the destruction efficiency of process vent streams (minimum, 98% DRE), including dioxin and furans, sent to the firebox of the TDU. Operating parameters, including oxygen content of the process off-gas leaving the heater, finished product temperature, firebox temperature and waste gas residence time in the firebox, CO or oxygen monitoring of the combustion gas stream must be established during performance testing. Conditions upon which the unit is tested will limit the operations, so operations must be tested using worst case conditions. System testing should also include capture efficiency verification.

• Emissions testing should include testing for the criteria pollutants and dioxin/furans. Methods might include EPA Method 23 enhanced by EPA SW846 Method 0010 for Dioxins, Furans, semi volatiles, and PAH's. The EPA Methods 201a and 202, are to be used for the measurement of Particulate Matter and Method 26A for Hydrogen Chloride. The condensed liquids should also be tested for dioxin and furans.

• Control of VOC emissions from the various storage tanks must be controlled with carbon canister or other means to achieve a minimum DRE of 98%. If carbon canisters or similar adsorbent are used, how will breakthrough be monitored so that controls can be achieved at all times? Monitoring carbon canisters to verify that there is not break through before the schedules change out.

• Requirements to measure feedstock VOC/HAP concentration (ppm) and feedstock vapor pressure for each feedstock shipment to confirm that assumptions used in computer models are correct.

• TD*X has stated that the process vent stream contributes about 30% of the BTU value for firing the furnace. How is this being accounted for in the emissions estimates?

• For solids generated on site, how has the VOC contents been quantified for use in the averaging VOC concentration in the solids? How will USET determine the concentration for recording keeping? It would appear, from the representations that the VOC contents of solids generated by USET have the potential to have higher VOC concentrations than the solids that are processed directly by the thermal oxidizer.

• On Bin emissions associated with the TDU, the calculations only appear to account for one bin and not four. The spread sheet appears to only use the surface area of one bin in the calculations. Please explain and correct if necessary.

• On the treated soil that is cooled by water, how is the proper operation of the dust collector assured when it appears to be treating a very moist vent stream.

Stabilization Operations

• In prior permitting of STAB2, USET has represented that all HAPs entering the process were uncontrolled. In the revision, the HAPS emissions from STAB2 and STAB3 are lower than the original STAB2 estimates based on using mass transfer rates dependent on the amount of time that the material is in the pans. Please provide detailed rationale on the emissions estimates from these various facilities and describe how and why the emissions estimation methods, including emissions control assumptions and claims, vary between sources.

• Verify control of PM daily based on visual emissions observations (Method 22) daily from stockpiles and at least monthly from any control device. Verify that if total or partial enclosures are used as partial control of particulate matter emissions, then verify that the buildings operate as represented (e.g., doors in place, conveyor belts with covers intact, etc.

• There appear to be no emissions accounted for filter press operations. Confirm and include emissions estimates.

• Current permit limitations are based in part on hours of operation. Verify that there is adequate recordkeeping to confirm these limitations are being implemented correctly.

Centrifuge and Catalyst Operations

• Are VOC emissions from the centrifuge operations accounted for? Confirm and include emissions estimates.

• Verify EPNs for the bag filters for each step in this operation, as it is unclear in prior TCEQ documents.

Landfill Operations

• Landfill operations should be included in the permit, or if not, then the emissions from the landfill operations must be included in determining PTE for the site.

Appendix A

Spreadsheet Tables of Air Program Authorizations